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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/586,174

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Toshihiko Ohashi

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EXAMINER

OMAR, AHMED H

ART UNIT

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2838

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,174	Applicant(s) OHASHI ET AL.	
	Examiner AHMED OMAR	Art Unit 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/01/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. As required by M.P.E.P. 609, the applicant's submissions of the Information Disclosure Statement dated 12/01/2008 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending.

Claim Objections

2. Claim 5 recites the limitation "the predetermined voltage value "Vd"" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. **Claims 1, 3, 4 and 6** are rejected under 35 U.S.C. 103(a) as being obvious over Rokuto (JP 2000-287373) in view of Sasaki (JP 04-042068).

As per **claims 1 and 4**, Rokuto discloses a power supply device comprising:

a capacitor unit in which capacitors are interconnected in series or series-parallel (See Par.1 and Fig.14, disclose an electricity accumulating device comprising two or more capacitors connected in series);

a charging unit for charging the capacitor unit at a constant current (See Fig.14 and Par.2, disclose a constant current source);

a detecting unit for detecting voltage on a high potential side of each capacitor (See Fig.8, Items#26 and Par.9 discloses voltage detection means connected to each capacitor);

a communication unit for outputting a determining result from the determining unit (See Fig.8, Items: Ry and 31, Par.12, disclose a relay such that is energized when a predetermined voltage has been reached, such that a signal is outputted by the second detection means [30] to the display means [32] to identify a deteriorated capacitor),

Rokuto discloses the determining unit is adapted to determine that a capacitor of the capacitor unit is abnormal based on the following condition:

a) over-voltage abnormal condition when a difference between respective voltages on the high potential side of the capacitor and an adjacent series capacitor exceeds upper-limit voltage "Va". (See Fig. 8, Item# Ry and 31, and Par.35, disclose a relay which operate an alarm light when the capacitor voltage exceeds a threshold value).

However Rokuto does not disclose the determining unit is adapted to determine that a capacitor of the capacitor unit is abnormal based on at least two of the following conditions:

a) over-voltage abnormal condition when a difference between respective voltages on the high potential side of the capacitor and an adjacent series capacitor exceeds upper-limit voltage "Va"

b) under-voltage abnormal condition when the difference between respective voltages on the high potential side of the capacitor and the adjacent series capacitor is lower than lower-limit voltage "Vb", and

c) negative voltage abnormal condition when a voltage value on the high potential side of the capacitor is negative.

However Sasaki discloses a parts deterioration detection device wherein the determining unit is adapted to determine that a capacitor of the capacitor unit is abnormal based on of the following conditions:

under-voltage abnormal condition when the difference between respective voltages on the high potential side of the capacitor and the adjacent series capacitor is lower than lower-limit voltage "Vb (See Fig. 2, Items #16 and 22 and attached abstract, disclose the capacitor voltage is compared to a threshold voltage, such that when the capacitor voltage is less than the reference voltage a deterioration signal is generated and relay [22] is open).

Rokuto and Sasaki are analogous art since they both deal with detecting defective capacitors.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention disclosed by Rokuto with that of Sakata to include a determining unit adapted to determine an abnormal capacitor in a capacitor unit based two abnormality conditions, i.e. over voltage and under voltage, for the benefit providing increased protection for the capacitor unit.

Claim 2 is cancelled

As per **claim 3**, Rokuto in view of Sasaki disclose the power supply device according to claim 1 as discussed above, wherein lower-limit voltage value "Vb" is expressed by $V_b = V_c/(2N)$, where "Vc" is a charge voltage value of the capacitor unit and "N" is series number of the capacitors (See. Rokuto disclose, Par.29 and Fig.5, disclose the lower limit voltage is lower than E4; lower than $V_c/2N$).

It would have been obvious to one of ordinary skill in the art to set the lower- limit voltage to half the charging voltage per capacitor ($V_c/2N$) since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

As per **claim 4**, Rokuto in view of Sasaki disclose the power supply device according to claim 1 as discussed above,

Wherein the determination unit starts determining if the capacitor in the capacitor unit is abnormal after charging has begun, and before charge voltage value "Vc" of the capacitor unit

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exceeds a predetermined voltage value 'Vd' (See Rokuto Par.28 and Fig.4, discloses the detection circuit starts abnormality detection as charging begins and before the capacitor voltage exceeds a voltage E1).

As per claim 6, Rokuto in view of Sasaki disclose the power supply of claim 1 as discussed above,

Wherein the upper-limit voltage is set as a withstand voltage value per one cell of the capacitors (See Fig.4, and Par.19, discloses E1 is the rated voltage of the capacitor "withstand voltage").

5. **Claim 5** is rejected under 35 U.S.C. 103(a) as being obvious over Rokuto (JP 2000-287373) in view of SASAKI (JP 04-042068) and in further view of Mitani (WO 2005/050811) (US publication# 2006/0038442 is an English equivalent of the PCT publication)

As per **claim 5**, Rokuto in view of Sasaki disclose the power supply device as disclosed to claim 1 above; However they do not disclose the predetermined voltage value "Vd" is expressed by $V_d = V_t \times \{ 1 + (N - 1 - M) \times (1 - \text{dev}) / (1 + \text{dev}) \}^\alpha$,

where "Vt" is a withstand voltage value per capacitor cell, "dev" is a capacity variation of the capacitors, "N" is series number of capacitors, "M" is the number of series stages including short-failed capacitors, and " α " is a detection error margin.

However, Mitani discloses $V_o = V_1 + (1 - (F_{deg} + A_{deg}) / (1 + (F_{deg} + A_{deg}))) \times V_1 \times (T - 1)$

Wherein V_1 is the withstand voltage value per capacitor cell, F_{deg} is the initial dispersion in the capacitor and the aged deterioration is A_{deg} and T is the number of capacitors connected in series. The use of α as a detection error margin is an obvious design choice to account for equipment measurement tolerances.

Rokuto, Sasaki and Mitani are all analogous art as they all disclose capacitor monitoring circuits.

It would have been obvious to one of ordinary skill in the art to modify the invention as disclosed by Rokuto in view of Sasaki with that of Mitani by starting the determination at the time when the charge voltage of the capacitor is at most a predetermined voltage value " V_d ", for the benefit of increasing accuracy of fault detection.

Response to arguments

Applicant's arguments filed 12/01/2008 have been fully considered but they are not persuasive.

In response to applicant's argument that Okamura's arithmetic unit [11] does not compute the voltage difference between the adjacent series capacitors. The examiner respectfully disagrees as the limitation in claim 1 "determine the abnormality when the difference between respective voltages on the high potential side of some adjacent capacitors exceed..." has been interpreted to indicate that the voltage between the high potential side on capacitor and the high potential side of the adjacent capacitor, which is the voltage across a single capacitor (interpretation enforced by applicant's Fig.4, V_{h1} and V_{h2}). Based on the interpretation Rokuto discloses a determining unit for determining existence of an abnormality by performing

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calculation based on the voltage detected by the detecting unit (See Fig. 8, Item# Ry and 31, and Par.35, disclose a relay which operate an alarm light when the capacitor voltage exceeds a threshold value), also Okamura discloses a determining circuit for determining an abnormality by performing a calculation based on the voltage detected by the detection unit (See Okamura, Figs.1 and 2 and Col.3, lines 34-47, , disclose a detection circuit [12] and a determining circuit [11] which receives the different capacitor voltages and based on those voltages determines an abnormality presented in the unbalanced state of capacitors which are indicated by the detection circuits are bypassing current).

In response to applicant's argument that applicant's claim 1 is different than the combination of Rokuto and Okamura because a determination unit is able to determine at least two out of three possible abnormal conditions, please refer to rejection of claim 1 above. Previous claim 1 was abnormality detection was written in the alternative which only requires the prior art to disclose one of the abnormality determination conditions.

Applicant's amendment necessitated the new ground(s) of rejection presented in this office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP §706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A Shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE- MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

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will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED OMAR whose telephone number is (571)270-7165.

The examiner can normally be reached on Monday-Thursday 06:30-16:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Akm Ullah can be reached on 571-272-2361. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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